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# THE JOURNAL OF POLITICAL ECONOMY

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MARCH—1896.

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## THE QUANTITY THEORY OF THE VALUE OF MONEY.

It is now eighty-five years since Ricardo first formulated the quantity theory of the value of money.<sup>1</sup> Assuming that the amount of commodities to be exchanged is at any time a fixed quantity, and that there is likewise a definite amount of the medium of exchange to perform this work, he concluded that prices would be the ratio between the bulk of commodities on the one hand, and the quantity of money on the other. It follows that a change in the amount of the circulating medium would cause a rise or fall of prices; or, as he put it, that there could be “no depreciation of coin but from excess.”<sup>2</sup>

This formulation of the theory has been generally received since Ricardo's time as the authoritative doctrine of prices. During this period, however, there has gradually come about a great change in the methods of performing exchanges, so that the industrial world of today is, in this respect, very different from that which Ricardo knew. This change suggests the question whether the quantity theory applies as well to modern conditions as it did to those existing in England in the first decades of the century.

<sup>1</sup> *Reply to Mr. Bosanquet's Practical Observations on the Report of the Bullion Committee*, chap. vi.; “Observations on the Principles of Seigniorage” (London, 1811).

<sup>2</sup> *Ibid.* p. 347 (McCulloch's edition of Ricardo's Works).

This question did not escape the attention of John Stuart Mill. Although he gave in his adherence to the general principle of the theory, as true under certain conditions, he was careful to point out that when other media of exchange besides money are used, "the connection between prices and the amount of the circulating medium is much less direct and intimate, and such connection as does exist no longer admits of so simple a mode of expression."<sup>1</sup>

This disposition to regard the change in economic conditions as requiring a limitation of the theory, has not been shared by many of its adherents. Indeed, at least one eminent economist has expressly denied the validity of such a limitation. President F. A. Walker has expressed the view that despite "the extreme extension of credit, to embrace the banking system, the check system, and finally the clearing-house system, . . . it still remains true that the demand for money, whatever that may be, does, taken in connection with supply, determine prices."<sup>2</sup>

This difference of opinion between economic writers of such high standing as Mr. Mill and Mr. Walker, makes the inquiry as to whether the quantity theory can be accepted as a satisfactory explanation of prices under existing conditions all the more pertinent and interesting.

At the very commencement of a discussion of this question the inquirer is met by an objection. The quantity theory, he is told, derives its validity directly from that of the fundamental economic law of demand and supply. Therefore it cannot be said to be open to question. Any pains bestowed upon an examination of its soundness are thrown away. "Prices," says President Walker, "being nothing more or less than values expressed in terms of money, those who hold the quantity theory merely point out a specific instance for the application of a principle which has been established by competent induction, and

<sup>1</sup> *Principles of Political Economy*, bk. iii. chap. viii. sec. 4.

<sup>2</sup> *Quarterly Journal of Economics*, October 1893, pp. 62 and 74.

the applicability of which is not challenged in any other instance within the view of the political economist."<sup>1</sup>

When the argument for the theory is put on this basis, an implicit denial of the general law of demand and supply is imputed to those who do not accept it. Such, however, has not been the position of the critics of the quantity theory. They have accepted the fundamental principle, and have rejected the theory, simply because it seemed to them inconsistent with the principle. The starting point of an examination of the theory, then, should be the consideration of this claim that it is simply an application of an unquestioned law of value. If it is found to be such, the correctness of its principle must be acknowledged. If not, immunity from criticism cannot be claimed for it.

The best method of discussing this question will be to take the general law, that the value of every commodity is fixed by the relation between the demand for it and the supply of it, apply it to the consideration of prices, and see to what conclusions it leads. As a definition of price, President Walker's explanation, that it is "the purchasing power of a commodity expressed in terms of some other article,"<sup>2</sup> may be taken. On these premises the argument proceeds as follows: The value of a bushel of corn is determined by the supply of and demand for corn, that of a bushel of wheat by the supply of and demand for wheat. The price of a bushel of wheat in corn is the number of bushels of corn for which it will exchange. If one bushel of wheat buys two of corn, the price may be expressed in the form of a proportion:

$$1 \text{ bushel of wheat} = 2 \text{ bushels of corn.}$$

Since the value of a bushel of wheat depends on the demand and supply of wheat, and since both of these forces are subject to constant variations, the value of wheat is a variable quantity. The same is true of the value of corn. Suppose that the demand for wheat increases so as to raise its value one-half. Then the above equation will become:

<sup>1</sup> *Quarterly Journal of Economics*, July 1895, p. 372.

<sup>2</sup> *Political Economy* (New York, 1895), p. 85.

1 bushel of wheat = 3 bushels of corn ;  
 that is, the price will rise. An increased supply of wheat will lower its value, and decrease its price in corn. Again, suppose that the demand for corn increases, so as to double its value, the last equation will change to :

$$1 \text{ bushel of wheat} = 1\frac{1}{2} \text{ bushels of corn.}$$

A greater supply of corn would have the opposite effect of lowering its value and raising the price of wheat in corn. Thus the price of one commodity in terms of another is a ratio between their respective values, which in turn are fixed by supply and demand. That is, the price is the resultant of four forces : viz., (1) the supply of the one commodity, and (2) the demand for it ; and (3) the supply of the other commodity, and (4) the demand for it.

Now price, as the word is commonly used, is the value of any commodity expressed in terms of some recognized denominator of value, whatever that may be, according to the monetary system of the particular country. What has been said of the price of wheat expressed in corn, applies perfectly to the price of any commodity in terms of any other. Since demand and supply regulate the values of commodities in conformity with their costs of production, the law may be expressed in these terms : the price of any commodity will be altered by a change either (1) in the supply of the article used as the denominator of value, or (2) in the demand for that article, or (3) by a rise in the cost of producing the given commodity, or (4) by a fall in this cost.

What is true of the price of a single commodity is equally true of the average price of a large number of commodities. Consequently the price level of a country is subject to change from these four causes : (1) If the demand for the article used as the denominator of value increases, and the other factors remain constant, less of the denominator than before will exchange for the same amount of commodities ; that is, prices will fall. (2) If the supply of the article used as denominator increases, nothing else changing, more of that article will be

offered for like amounts of goods; that is, prices will rise. (3) If the average cost of producing goods increases, while the other factors are constant, more of the article used as denominator will exchange for an equal amount of commodities; that is, prices will rise. (4) Finally, if the average cost of producing goods decreases, and no other change occurs, less of the denominator will buy the same amount of goods; that is, prices will fall. (5) To take a more complex case, suppose that the demand for the article used as the denominator of value and the average cost of producing goods increase simultaneously. The increased demand for the denominator will tend to lower prices; the increased cost of producing goods to raise them. Then, according as the first force is more potent than, equal to, or less potent than the second, will prices fall, remain unchanged, or rise. (6) If the demand for the article used as denominator increases, while the average cost of producing goods decreases, each change will tend to lower prices. (7) If the supply of the article used as denominator increases, together with the average cost of producing goods, the two tendencies will again be in the same direction, and prices will doubly rise. (8) Lastly, if the supply of the article used as denominator increases and the cost of producing goods decreases, the changes will be opposed to each other, and three results are possible: (*a*) a rise of the price level, if the increased supply of the denominator prove to have the greater effect; (*b*) no change at all, if the two tendencies exactly counteract each other; (*c*) a fall, if the decreased cost of production overbalances the opposing force.

It would be easy to continue the consideration of possible combinations of these factors which fix prices in such cases, for example, as an increase in the cost of producing goods, accompanied by a rise of both the demand for, and supply of the article used as the denominator of value. But the foregoing discussion is sufficient to show how intricate the price problem really is, and what careful study is required in explaining all movements of the general level. Take for example the well-known fact that prices fell 7.8 per cent. in the United States between 1860

and 1891. How is this phenomenon to be examined and explained? What has been said must make it plain that such a fall might be due to any one, or to more than one, of a number of causes: for example, to a lessening in the average cost of producing goods, increasing the supply on the market; or to a falling off in the demand for goods consequent upon an increased cost, such as a lessened efficiency of labor would produce; or to an increased demand for the article used as a denominator of value, such as might be brought about by a greater non-monetary consumption; or to a decreased supply of that article, which might result from increased hoarding, or from a lessened production extending over a period of years; or to various combinations of such causes. Thus the mere fact of the fall of prices, is no index to show which of many possible causes was the real one. This can be found only by means of lengthy and careful investigations into the factors which have been at work affecting the values both of the denominator and of commodities.<sup>1</sup>

The application of the law of demand and supply thus leads to the conclusion that the general price level is subject to fluctuations arising from changes in the cost of producing goods, quite as much as to alterations caused by changes in the demand or supply of the article used as the denominator of value. The argument that the quantity theory is but an application of the law of demand and supply may now be examined in the light of this conclusion. It is true, as the theory states, that the value of money—meaning the article commonly used as the denom-

<sup>1</sup> This intricacy of the price problem seems to be one reason for the many inconsistencies in the explanations commonly offered of changes in the general level of prices. A second reason seems to be that the problem is commonly thought to be very simple. The expectation of finding an easy and certain solution by *a priori* reasoning is of itself a proof that the complexities and difficulties in the way are not suspected. When, for instance, President Walker explains the fall of prices in this country by a relative increase in the demand for money, without giving any evidence for this view, is not the very simpleness of the procedure ground for questioning its conclusiveness? and does it not indicate that the theory, on which it is based, takes but a superficial and inadequate view of the facts?—See President Walker's article in *The Quarterly Journal of Economics*, July 1895.

inator of value—is determined by the same law as the value of any other commodity; but this cannot be taken to mean that the level of prices is fixed solely by the supply and demand for money, which is only one term of the comparison involved in price making. The foregoing discussion has shown that price is a ratio between two terms—money and commodities—and that it will change when either of these changes. Thus the law of demand and supply, invoked as the unquestioned guaranty of the validity of the quantity theory, proves, when applied to the price question, that the theory is inadequate, because it does not take cognizance of all the factors which, working together, fix the general level of prices. It is not admissible, then, to claim that the theory is but one application of demand and supply, on the ground that prices are “nothing more or less than values expressed in terms of money.”<sup>1</sup> This is the very point, that so soon as values of commodities are expressed in terms of money, those values are dependent, not on the demand and supply of the money alone, nor on the cost of producing the commodities alone; but upon the combined action of supply and demand for money and the cost of producing the commodities.

It seems to be quite evident, then, that an actual application of the law of demand and supply shows no reason for the claim that the quantity theory is merely a deduction from that law. The theory, therefore, must be discussed on its own merits, whatever they may prove to be, as an explanation of prices. The line of argument followed above suggests the direction and the method in which a farther examination may proceed. The law of demand and supply may be applied, now more in detail, to discover whether the theory gives a satisfactory explanation of the forces which affect (1) the money side of the price ratio, and (2) the commodity side.

In taking up the first of these questions, it will be well to quote President Walker's lucid exposition of the way in which the value of money is determined. “The value of money,” he

<sup>1</sup> F. A. WALKER, *Quarterly Journal of Economics*, July 1895, p. 372.

says, "is purely a question of demand and supply. . . . The demand for money is the occasion for the use of money in effecting exchanges: in other words it is the amount of money work to be done." The supply of money "is the money force available to do the money work which the demand for money indicates as required to be done, in the given community, at the given time." It "is composed of two factors—the amount of money, and the rapidity of circulation."<sup>1</sup> This explanation is made more explicit when interpreted in the light of the same writer's well-known definition: "Money is that money does."<sup>2</sup>

In considering this explanation it is necessary to make a distinction between the different ends which money serves. Of the three functions commonly enumerated—a medium of exchange, a denominator of value, and a standard of value—it is with the latter two that the study of prices is chiefly concerned. The price of a commodity is its value expressed in terms of money. A theory of prices, then, must explain the demand and supply of money as the denominator of value. The explanation offered by the quantity theory is that everything that performs money work is to be considered as a part of the supply. That is, the value of money serving as the denominator of value, is fixed solely by the supply and demand of the medium of exchange. If the demand and supply of the medium of exchange are the demand and supply of the denominator of value, does it not follow that no distinction can be drawn between the two categories, and that all kinds of money serve alike as denominators of value?

Consider this position for a moment in connection with the existing monetary conditions of the United States. There are nine different kinds of money in circulation,<sup>3</sup> with intrinsic values ranging from the worthless bit of paper of which a United States

<sup>1</sup> *Political Economy*, pp. 133 and 136.

<sup>2</sup> *Money in its Relations to Trade and Industry* (New York, 1885), p. 1. President Walker has himself applied this definition as a test of what should be included in the supply of money. He concludes that bank notes are a part of the supply.—See *Quarterly Journal of Economics*, October 1893.

<sup>3</sup> These are gold coin, gold certificates, silver dollars, subsidiary coin, Treasury

note is made, to the silver (worth about fifty cents) in a silver dollar, and to the gold in an eagle, worth as bullion its full face value. But all these different kinds of money are maintained at a uniform value, as is proven by their continuing in concurrent circulation. This condition is to be accounted for, of course, by the fact that at the basis of the system is the gold standard, in which all other forms of money are redeemable, and to the value of which the other kinds of money conform. If any one doubt this, let him consider what would happen if the redemption through the treasury or the customs-house receipts, of other forms of money in gold should cease. Unless he is prepared to assert that under those conditions a premium would not appear on gold, he cannot deny that it is redemption in gold that gives their present value to other kinds of money.

If this be true, it means that, although in this country there are several different media of exchange, there is but a single standard and denominator of value, namely, gold. All prices, then, are gold prices; that is, they are the values of commodities compared with the value of 25.8 grains of gold in the form of a dollar. If a hat is sold for five dollars, it means that the forces of demand and supply of hats of that particular kind, and the demand for and supply of gold, have determined the hat to exchange against gold dollars at the ratio of one to five. This rate of exchange, or price, is just the same whether the hat is paid for by a check, or in greenbacks, or in subsidiary coin, or in silver dollars, or in gold. The medium in which the transaction is settled has nothing whatever to do with the denominator in which the value of the hat is expressed.

To so much, perhaps, most would agree; but there seem to follow conclusions at variance with the quantity theory. For, applying the law of demand and supply once more, if price is a ratio between commodities and gold, it must be that nothing can affect price unless it affect the demand for or supply of commodities, or of gold. Then we may ask how can an increased

notes (1890), silver certificates, currency certificates, national bank notes, and United States notes.

supply of other kinds of money, besides gold, affect prices? According to the theory, a greater circulation of copper cents, or of subsidiary silver, would have the same proportional influence in raising prices as an equal sum of gold coins. But how could they alter the demand or supply of gold? One may conjecture that an increased issue of silver dollars might have an indirect influence on the price level by indicating a weak monetary policy on the part of the government, and so giving rise to the suspicion that the standard and denominator of value was to be changed; or by taking the place of some of the gold coins in circulation, and thus decreasing the demand for gold; or by compelling the government to buy more gold in order to keep up the reserve for redeeming the silver on demand. But, however this might be, it is plain that it is only by affecting the demand or supply of gold, the denominator of value, that the supply of other media of exchange could be of any consequence in fixing prices.

There seem, then, to be good reasons for amending the theory—as indeed some of its adherents have suggested<sup>1</sup>—by considering only the supply and demand of *standard* money. But the amendment cannot stop here. If only standard money is included, and gold is that standard, one immediately asks whether the explanation of demand and supply offered by the theory is adequate. As was seen above, the theory considers only the monetary demand and the monetary supply. But does the value of the standard money, gold, depend solely upon the monetary demand and the supply of gold coins?

An answer to this question is suggested by noting the significance of the facts (1) that there is free, and in this country also gratuitous coinage of the standard money; and (2) that coins of the standard money do not necessarily remain in that form, but are frequently sold in the market as so much bullion, and con-

<sup>1</sup> PROFESSOR J. SHIELD NICHOLSON, for example, states the theory in this form: "The quantity of standard money, other things remaining the same, determines the general level of prices, whilst, on the other hand, the quantity of token-money is determined by the general level of prices."—*Treatise on Money and Essays on Monetary Problems* (Third edition, London, 1895, p. 93).

sumed in the arts.<sup>1</sup> Under these circumstances it is evidently impossible that there can be any variation between the value of 25.8 grains of gold in the form of a dollar and in the form of a bar. The coin cannot be of less value than an equal weight of bullion, because it is continually sold in the open market; nor can it be of greater value, because all owners of bullion are free to send it to the mint and have it converted into coin. Thus the value of gold coin and gold bullion must always be identical, because there is a constant ebb and flow between the two.

But if it is true that there can be no material variation between the values of gold in different forms, does it not follow that the value of gold coins will be partly dependent on the value of gold bars; that an increase or decrease in the quantity of bullion, which alters its value, will likewise alter the value of gold coin? To hold that the value of the article used as the denominator of value is determined solely by the supply and demand for the article in that particular form, is like holding that the water level in New York harbor is dependent only on the amount of water that is poured into it by the rivers, and that is evaporated from it by the sun, without considering that its level must always conform to that of the Atlantic Ocean.

The treatment furnished by the quantity theory of the conditions governing the value of the money side of the price ratio, thus appears to be quite inadequate. It considers but one, and

<sup>1</sup> Ricardo, in his exposition of the quantity theory, was very careful to limit its application to countries in which the government had an absolute control of the amount of the circulation. "While the state alone coins," he says, coin "can be raised to any conceivable value . . . by limiting the amount." He even thinks it necessary that the public should "be secured against . . . illegal additions to the circulating medium." This indicates that Ricardo himself would not regard the theory as applicable to a condition of affairs in which the control of the amount of the circulation had passed out of the hands of government. But this is a result which follows inevitably from the passage of free coinage laws, by which the government undertakes to coin bullion brought to it by any individual. Such free coinage provisions have been made by almost all commercial nations. Therefore no one is justified in quoting Ricardo to support the quantity theory as applied to present conditions. The careful restrictions which he laid down expressly forbid the application of the principle under such circumstances.—See the *Reply to Mr. Bosanquet's Practical Observations*, chap. vi.; and *Principles of Political Economy and Taxation*, chap. xxvii.

that not the most important, source of demand and supply of gold. A brief study will make this evident. As has been seen, it is the relation of the total supply of gold to the total demand that determines its value. The supply on the market includes the product just coming from the mines, old ornaments, coins of different countries, and gold in many other forms. The demand for gold is mainly for three different kinds of consumption; viz., for coinage, for export to countries outside the civilized portions of the globe, and for consumption in the arts. To this should be added the wear of coins and chance loss. Dr. Soetbeer's investigations led him to the conclusion that the total monetary consumption of gold averages less than one-third of the total non-monetary consumption.<sup>1</sup> In the light of these facts, can it be admitted that the value of gold is dependent solely upon the monetary demand and supply? If not, is there not good reason for asking a broader treatment of the money side of the price problem than is furnished by the quantity theory?

Thus there seem to be sufficient reasons for refusing to accept the quantity theory as an explanation of prices under such conditions as prevail in the United States at present. Such a conclusion, however, is no proof that the theory may not be valid under other conditions. Economic laws are not propounded as equally true under all conceivable circumstances. The validity of any law is to be pronounced upon, only in relation to some particular environment.

A search for the possible circumstances, under which the quantity theory would give a satisfactory account of the forces that fix prices, is beyond the scope of this study. It will not be amiss, however, to consider one case, not infrequent in monetary history, to which the theory is thought to apply with particular

<sup>1</sup> *Materials for the Illustration and Criticism of the Economic Relations of the Precious Metals and of the Currency Question*. [Translated in the *Final Report of the Royal Commission on Gold and Silver*, Appendix, p. 179.] The total non-monetary application of gold in the civilized world in 1881-5 is estimated at 574,000 kilograms; the monetary application at 172,000 kilograms.

rigor. "Probably the very best instance of the theory," says Professor Nicholson, "is the case of inconvertible paper. There every one admits that the value depends on the quantity."<sup>1</sup>

This statement may not appeal to every one as carrying its own conviction with it. Some might reply that, on the contrary, it would seem natural to suppose that the value of inconvertible paper is least likely to depend on the quantity of it; that its value will conform, in fact, to the confidence felt by the public mind, that the paper will some time be redeemed; and that the issue of a great quantity is likely to cause depreciation, because it will shake this confidence, since it is a public confession of the financial weakness of the government. A discussion of these opposing views would require much space, and might not be productive of conclusive results. But by leaving aside the theoretical discussion, and appealing to facts, some light may be obtained.

With this purpose, the question may be asked whether the value of United States notes, for the years 1862 to 1878, can be explained on the hypothesis that it was governed solely by the relation between the supply and demand for money, that is, between the volume of the money in circulation and the amount of goods to be exchanged by the use of money. Why was it that the premium on gold, which may be accepted as an approximate measure of the depreciation of notes, declined from an average 203.3<sup>2</sup> in 1864 to zero by the end of 1878? The supply of money increased in the meantime, so it could not be because of changes on the supply side. Then it is to be supposed that the amount of goods to be exchanged increased so greatly as to offset the increased supply, and raise the value of the currency from 49 per cent. to par? Does this seem more probable than the other explanation, that the value of the greenbacks rose

<sup>1</sup> J. SHIELD NICHOLSON, *A Treatise on Money and Essays on Monetary Problems*, p. 144. President Walker also applies the quantity theory especially to determine the value of paper money.—*Political Economy*, part 3, chap. v.

<sup>2</sup> The yearly premium on gold, and the yearly amount of the circulating medium, 1860 to 1891, may be found in a table printed in the *JOURNAL OF POLITICAL ECONOMY*, March 1895, p. 156.

because the confidence in the financial ability of the government, which had been much shaken during the war, was revived by the return of peace, and finally restored entirely by the resumption of specie payments January 1, 1879?

If the former seems more likely, we may go a step farther. Why did the premium on gold rise from an average of 145.2 in 1863 to an average of 203.3 in 1864? The supply of money in circulation had increased only  $12\frac{1}{2}$  per cent.,<sup>1</sup> but meantime the currency price of gold had risen 40 per cent. Is it to be supposed that the money work had declined sufficiently in one year to account for the discrepancy?

But a still stronger case can be found. Why was it that the premium on gold which stood at 145 on the first of July, 1863,<sup>2</sup> fell to 138 on the sixth, to  $133\frac{3}{8}$  on the eighth, and to  $123\frac{1}{4}$  on the twentieth of the month? Did the money work increase in these few days to such an extent as to cause so considerable a rise in the value of the circulating medium? Is it a mere coincidence that this rise followed two great victories of the Union armies? The battle of Gettysburg was raging July 1, 2 and 3. Vicksburg surrendered July 4. July 5 was Sunday. When the market opened Monday, gold had fallen to 138. As Lee retreated with his defeated army across Pennsylvania and Maryland, back into Virginia, the premium fell rapidly, and by the twentieth of the month was down to  $123\frac{1}{4}$ .

These experiences of the United States seem to demonstrate quite clearly that the value of inconvertible paper may rise or fall for reasons that affect neither the supply of it in circulation, nor the amount of work it has to perform. This new factor is the confidence that people feel that the paper will one day be redeemed. If the financial standing of a government is strong, this confidence will be high, and the paper will depreciate little, if any. If the government is in a perilous position, this confidence will be low, and the paper may depreciate to any extent.

<sup>1</sup> Volume of currency 1863, \$595.3 millions; 1864, \$669.6 millions. JOURNAL OF POLITICAL ECONOMY, March 1895, p. 156.

<sup>2</sup> See *Commercial and Financial Chronicle*, vol. i. p. 165, for a table of the daily highest and lowest prices of gold at New York, 1862-5.

Everything that affects this confidence, will affect the value of the currency. But the quantity theory has nothing whatever to say about this factor in the situation. It can hardly, then, be accepted as a satisfactory explanation of the value of inconvertible paper. This conclusion naturally suggests the reflection that if "the very best instance of the theory is the case of inconvertible paper," as Professor Nicholson holds, the theory must be satisfactory in very few cases.

Turning now to the second of the suggested lines of inquiry, do we find in the quantity theory a more satisfactory treatment of the commodity side of the price problem than that offered for the money side?

The preliminary study of demand and supply showed that the level of prices is liable to be altered by a raising or lowering of the average cost of production. How far is this fact taken into account by the theory? In the brief statements commonly given, no notice is taken of anything but the demand and supply of money.<sup>1</sup> But in more detailed expositions the idea makes its appearance that somehow the commodity side is included in the money side; as if the supply of goods were the demand for money, and the demand for goods were the supply of money. This of course could be true only in an economy where all exchanges were actually performed by the transfer of money; for as soon as any goods were exchanged against each other by barter, the supply of money would no longer include the total demand for goods, nor would the demand for money be the total supply of goods. It is evident, then, that the idea is totally inapplicable to a condition of affairs like the present, where a very large proportion of commercial transfers are settled without the use of any money.

In order to explain existing conditions, President Walker has given a careful restatement of the theory, according to which

<sup>1</sup> Compare, for instance, President Walker's concise statement, "The demand for money, whatever that may be, does, taken in connection with supply, determine prices."—*Quarterly Journal of Economics*, October 1893, p. 74.

the demand for money is the total supply of commodities exchanged, minus the amount exchanged by barter and the use of credit instruments. "The demand for money," he says, "is the amount of money work to be done. This is not determined by the gross volume of the wealth of the community, since all that wealth is not to be, in fact, exchanged. For a similar reason it is not determined by the amount of the annual production of the community. It is not determined by the value of products to be exchanged, inasmuch as some classes of these may require to be exchanged several times, and some but once. Moreover, in spite of the difficulties of barter, . . . many products are . . . exchanged against each other; while . . . the modern organization of commerce, especially through the agency of banks, provides for the creation and subsequent cancellation of indebtedness on account of products given and taken in exchange, to an extent which vastly diminishes the actual use of money in effecting transfers."<sup>1</sup> It is therefore only that part of the total supply of goods which actually is exchanged by the use of money that is compared with the supply of money. The general price level is determined by the comparison between these two amounts; and the prices thus fixed, determine the rates at which goods transferred without the use of money shall be exchanged. It follows from this, that an increased supply of commodities, such as would result from a decreased cost of production, could not lower prices unless it actually increased the demand for money.

Now the slightest consideration of the present conditions of exchange will make it evident that there is no necessary connection between an increased supply of commodities and an increased demand for money. There is a complete *non sequitur* in the argument from the one to the other. In the first place an increased supply of goods does not necessarily require any increase in the media of exchange. The total amount of the instruments of exchange required to transact a community's

<sup>1</sup> *Political Economy*, pp. 133, 134. Compare also President Walker's article in the *Quarterly Journal of Economics*, October 1893.

business is not fixed by the amount of the goods to be exchanged, but by the amount multiplied by the price. It takes no more money to exchange 2000 tons of steel at twenty dollars a ton, than to exchange 1000 tons at forty dollars. Thus the total volume of goods exchanged may increase enormously without requiring any larger circulating medium.

But, even if the increased supply of goods should require an increase in the circulating medium, this increase would not necessarily be an increase of money. This is plain enough when one thinks of the large amount of exchanges performed by the use of credit instruments. An approximate estimate of the relative importance of the monetary and non-monetary media of exchange, may be obtained by comparing the deposit currency of the banks with the amount of money in circulation. October 1, 1894, the bank deposit currency of the country amounted to \$2963 millions.<sup>1</sup> The total monetary circulation for the same year is estimated at \$1660 millions.<sup>2</sup> These figures show that the bank money forms a much larger part of the country's mechanism for effecting transfers than the legal currency. It is not at all unlikely then, that even a considerable increase in the supply of commodities would have no appreciable effect in increasing the demand for this minor part of the whole volume of the medium of exchange.

But we can go farther than this. It has been shown above that the supply and demand of all forms of money are not of equal importance in the discussion of prices, because prices are ratios between the volumes of commodities and of the standard money. It followed that it is the supply and demand of this standard money only that can affect the price level. Now the the monetary circulation of the country is not composed wholly of gold. In 1894 the gold coin and gold certificates in circulation amounted to \$562.2 millions; money of other kinds to \$1098.6 millions.<sup>3</sup> The gold thus formed a little over one-third

<sup>1</sup> LAUGHLIN, *Facts About Money*, p. 225.

<sup>2</sup> *Statistical Abstract of the United States* (1894), p. 30.

<sup>3</sup> *Statistical Abstract of the United States* (1894), pp. 27-30.—The statement of the

of the monetary circulation. Then an increased demand for currency would not necessarily create a demand for gold. Taking the larger view, the supply of gold money in 1894 was less than one-eighth part of the total circulation of the country, that is, the legal money plus the deposit-currency of the banks.

How then, we may ask, can the quantity theory explain the change of prices that results from a lowered cost of production? How much ground is there for the inference that the increased supply of goods will increase the demand for gold? There are two breaks in the chain of causation. An increased volume of goods produced does not necessarily require a greater amount of the medium of exchange; and secondly, if it did, the demand for the circulating medium might be increased very much without altering the demand for gold, which forms but one-eighth part of the whole. But unless the demand for gold is increased, how is the lowered cost of production and consequent increased supply of commodities, to have its effect upon prices?

The position of the adherents of the quantity theory, when analyzed, seems then to reduce itself to this: That unless an increased supply of commodities does increase the demand for the money used as the denominator of value, it cannot affect prices. This is not a proposition that will readily commend itself to an intelligent person. Indeed it seems directly opposed to the conclusions naturally drawn from the law of demand and supply. According to that law, when the value of hats, for example, is compared with that of gold, as the naming of the price of hats in terms of money does compare their values, an increase in the supply of hats will tend to lower the price, even though the supply and demand for gold remain absolutely constant. The price does not continue the same until the increased supply of hats raises the demand for gold, and then change. If any one chooses to affirm this, is he not equally bound to affirm, according to the law, that an increased supply of gold can-

Treasury for January 1, 1896, gives the gold in circulation as \$484.7 millions; the total monetary circulation as \$1579.2 millions. Gold therefore forms but 30.6 per cent. of the currency of the country at present.

not raise the price of hats unless it increases the demand for hats?

The decisive shortcoming of the quantity theory, then, seems to be that it is not in accordance with the law of demand and supply. It looks at prices entirely from the point of view of money. It is conceived that the value of money in commodities, as expressed in the price level, is fixed by the supply and demand for money alone. The supply and demand for the various commodities are of importance only in so far as they affect the demand for and supply of money, the denominator of value. It is impossible, according to the quantity theory, that the price level should be altered by a change in the cost of producing commodities, if the supply and demand for the article used as the denominator of the value remain constant. But prices are a ratio between two terms, and the law of demand and supply shows that both terms are likely to change. What reason is there then for saying that the ratio can be altered only by a change in the first term; implying that the second term may rise or fall as it will, without changing the ratio, so long as the first quantity is unaltered? And this, too, when it cannot be shown that a change in the second quantity will cause a corresponding change in the first. Is not the entire one-half of the price problem left completely out of consideration in this treatment?

In the preceding pages an attempt has been made consistently to apply the general law of demand and supply to the price problem, and to examine the quantity theory by the conclusions thus obtained. The result of the study has not been favorable to the theory. Its treatment both of the money side and the commodity side has been found to be defective. As an explanation of prices it seems to be inadequate when viewed from the theoretical standpoint.

Deductive reasoning, however, is proverbially likely to lead the inquirer astray, unless its results are checked and corrected by inductive investigation. Such a theoretical examination as the

above might well be complemented by applying the test of fact to the theory. If it were found to offer a satisfactory explanation of the price phenomena of actual life, a strong presumption would be created against the criticisms suggested. If, on the other hand, the theory failed to account for observed facts, the case against it would be more complete.

Such an inductive study of the theory has been made by Miss S. McLean Hardy.<sup>1</sup> As data, she has taken the official estimates of the amount of money in circulation in the United States for the years 1860 to 1891, and Dr. Faulkner's price percentages for the same period. The comparison made by her shows that prices fell, during the whole period of thirty-two years, 7.8 per cent., while the quantity of money in circulation increased 243.9 per cent. This leads Miss Hardy to conclude that the course of prices in this country cannot be explained by the quantity theory, as these facts flatly contradict the supposition that an increased supply of money raises prices.

President Walker has replied to Miss Hardy's study, taking the ground that the inductive test applied is not a fair one.<sup>2</sup> He admits that prices have fallen in the United States, while the supply of money has increased; but he attributes this to the fact that the demand for money has increased even more rapidly than the supply. On this supposition he is able to explain the facts adduced by Miss Hardy in accordance with the quantity theory.

It may be objected to this answer that it leaves off just at the vital point. President Walker expressly states that his belief that the demand for money has increased is diametrically opposed to a considerable body of opinion.<sup>3</sup> The point, too, is of crucial importance to his position; for unless it can be main-

<sup>1</sup> "The Quantity of Money and Prices, 1860-1891," JOURNAL OF POLITICAL ECONOMY, March 1895.

<sup>2</sup> *Quarterly Journal of Economics*, July 1895. "The Quantity Theory of Money."

<sup>3</sup> "I take issue bluntly," he says, "with the writers of the gold monometallist school generally, Mr. Wells, Mr. Horace White, Mr. Atkinson, Professor Sumner, and others, regarding their unverified assumption that it is in the nature of an advancing industrial civilization to require smaller and still smaller amounts of 'the circulating medium.'"—*Ibid.* p. 378.

tained his defense of the theory falls to the ground. And yet he has not thought it necessary to submit any evidence, or give any reason beyond a mere assertion, in support of his view.<sup>1</sup>

The only sentence in the article which can be regarded as in any way a proof of the statement is that in which it is said that the supply of money in the country has increased, without "the sole sign of inflation—namely rising prices" making its appearance.<sup>2</sup> This is a proof, however, which cannot be accepted by those who doubt the validity of the quantity theory. To quote the lower prices accompanying an increased supply, as a proof that the demand for money must have risen, is merely to reassert the very thing to be proven.

Since President Walker has not explained the grounds on which his confident assertion of the increased demand for money rests, it will not be amiss to collect and examine whatever evidence is available bearing on the subject.

To say that the demand for money has increased, means that the amount of money work to be done has grown more rapidly than the means for performing it. President Walker has explained very clearly that the demand for money is a product of two variables; "the amount of goods which must be exchanged through the intervention of money," on the one hand, and the number of times "each commodity may require to be thus exchanged, on the other."<sup>3</sup> If the demand for money increased between 1860 and 1891, either more goods had to be exchanged by the use of money, or an equal amount had to be exchanged more times, or a greater amount had to be exchanged a greater number of times, at the latter date than at the former.

There can be no doubt whatever that the amount of commodities exchanged in the United States increased vastly during

<sup>1</sup> "The multiplication of commodities due to the increased facilities of production, the marvelous increase of travel, and changes in the habits of our people with respect to carrying and spending money, are continually creating a demand for a larger and still larger volume of actual money, in spite of improved agencies of exchange and rapidly multiplying instruments of credit."—*Quarterly Journal of Economics*, July 1895, p. 379.

<sup>2</sup> *Ibid.* p. 379.

<sup>3</sup> *Ibid.* p. 373.

this period. Of course there are no statistics which show the exact ratio of this increase; but some data are accessible that may be taken as a basis for an estimate.

The increase in the amounts of agricultural products is indicated by the following facts. Between the years 1860 and 1891, the production of cotton increased 89 per cent.; of wool 280 per cent.; of sugar 89 per cent.; of molasses 40 per cent.; of corn 77 per cent.; of wheat 130 per cent.: of farm animals 113 per cent.<sup>1</sup>

In manufactures the increase is even more marked. The census of 1860 reported the total value of manufactured products for that year as \$1,885,861,676. The census of 1890 gives the amount as \$9,372,438,283. This is an increase of 397 per cent.<sup>2</sup> I have not been able to find statistics which would enable similar estimates to be made of the increased production of mines, fisheries, etc. What has been presented indicates that agricultural production somewhat more than doubled in the thirty years, while the value of the manufacturing output increased nearly five-fold.

Perhaps equally valuable as indications of the increase of transactions are the following more general statistics. The imports of merchandise increased 138 per cent. during the period, while the domestic exports gained 175 per cent.<sup>3</sup> The "true

<sup>1</sup>	Production, 1860	Production, 1891
Cotton	(million pounds) 2,275.3	4,316.0
Wool (1861)	" " 75.0	285.0
Sugar	" " 255.1	483.4
Molasses	" gallons 17.8	25.0
Corn	" bushels 837.8	1,489.9
Wheat	" " 173.1	399.2

—*Statistical Abstract* (1878 and 1894).

Farm Animals (value 1860) \$1,089.3 millions; (value 1891) \$2,329.7 millions

—*Eighth Census* (1860), volume on Agriculture, p. 185.

<sup>2</sup>	Value 1860	Value 1891
Manufactures	\$1,885.8 millions	\$9,372.4 millions.

—*Eighth Census*, Manufactures, p. 742. *Statistical Abstract* (1894), pp. 294 and 359.

<sup>3</sup>	1860	1891
Imports	\$353.6 millions	\$844.9 millions
Exports	316.2 "	872.2 "

—*Statistical Abstract* (1894), p. 73.

valuation" of the real and personal property of the country was \$16,159,616,068 in 1860 and \$65,037,091,197 in 1890; a gain of 302 per cent.<sup>1</sup> The increase of population, on which President Walker lays so much stress, was not quite 91 per cent.<sup>2</sup>

But accompanying this great increase in the amount of commodities exchanged, there has taken place an alteration in the mechanism of distribution, by which the number of times that goods change hands in passing from producer to consumer, has been lessened.<sup>3</sup> The tendency of competition in the last two or three decades has been to concentrate production on the one hand, and to simplify exchange on the other. Large manufacturing companies are in many cases producing their own raw material, or buying it at first hand from the producers, without the intervention of factors. They are selling their products direct to retailers, or even to consumers, in order to save the profits of the jobber or wholesale merchant. This driving out of the "middle-man" is a very important factor to be taken into account in studying the demand for money, because it greatly decreases the number of exchanges to be performed.

So much for the increase of transactions. There has been a considerable gain in the amount of goods, partly offset by a decrease in the number of times that any commodity changes hands.

But as the volume of exchanges has increased there has been

<sup>1</sup> *Statistical Abstract*, p. 372.

<sup>2</sup> *Ibid.* p. 5. Population 1860, 31,443,321; 1890, 62,622,250. According to President Walker's own analysis of the demand for money, it is difficult to see that an increase of population is an indication of an increased demand for money. The demand is the money work to be done, that is the total of goods to be exchanged minus the amount exchanged by the use of non-monetary media. Surely the increase of population is not evidence that the use of credit instruments has declined. Whatever force it has must then be to show that the production of the country has risen. This involves the assumption that more people will have more goods. That may be so, or it may not. There is no necessary connection between the two; nor can it be shown even that there is any regular proportion between an increasing population and an increasing production. At best, the consideration seems but little pertinent to the argument, for it is only the "more goods," not the "more people," that has anything to do with the demand for money, as President Walker explains that term.

<sup>3</sup> Cf. D. A. WELLS, *Recent Economic Changes*, pp. 110, 111.

a concomitant increase in the means for effecting them. These means are of two sorts, monetary and non-monetary. The enlarged use of the latter sort, comprising all the varieties of credit instruments, is one of the most striking features of the age in business circles. "Never before in the history of the world have there been so many and such successful devices invented and adopted for economizing the use of money. Every increase in the facilities for banking, and for the granting and extension of credits, largely contributes to this result; the countries enjoying the maximum of such facilities requiring the smallest comparative amount of coin for their commercial transactions."<sup>1</sup>

Some idea of how extensive this movement has been in the United States may be gained from statistics showing the expansion of our banking system. The *Finance Report* of 1860 gives the number of banks in the country at that time as 1392, with total deposits amounting to \$253,802,129.<sup>2</sup> In the fiscal year 1891-2, there were 8029 national, private and state banks in the country, with individual deposits of \$2500.1 millions. This is an increase of 476 per cent. in the number of banks, and 885 per cent. in the amount of deposits. If banking houses of all sorts are included, in order to make the comparison with the figures given for 1860 more fair, it appears that the number of banks was almost seven times greater at the later date than at the former, while deposits had increased more than elevenfold.<sup>3</sup>

As every device for performing exchanges and paying debts without the use of money, lessens, by just so much, the demand for money, we should include figures showing the increased use of all such means of payment. The operations of clearing-houses, by which debts are cancelled by being balanced against each other, plainly come under this head. The transactions of the New York clearing house have increased enormously since 1860. In 1890 the clearings amounted to 520.8 per cent., in

<sup>1</sup> *Recent Economic Changes*, p. 211.

<sup>2</sup> *Ibid.* p. 448.

<sup>3</sup> See *Report of the Comptroller of the Treasury* (1892), vol. i. p. 85; and *Statistical Abstract* (1894), p. 43.

1891 to 470.9 per cent., and in 1892 to 501 per cent. of their amount in 1860.<sup>1</sup> The growth of the clearing-house system for the country as a whole has been even more marked. In 1860 only five of these institutions were in operation.<sup>2</sup> In 1891 fifty-seven reported to the Secretary of the Treasury. In that year the total clearings for the United States were over 57 billion dollars.<sup>3</sup>

Many other devices, which are employed to obviate the necessity of using money, might be mentioned; but there exist no statistics which show the extent of their use. Thus, doubtless, a very considerable amount of exchange is performed by means of book accounts, which are balanced against each other, and merely the balances paid by checks or money. All barter transactions also lessen the money work. But such operations leave no trace, and their amount could not be estimated; so that the only account we can take of them is to notice that they afford a broad margin for our calculation.

The great extension in the use of credit instruments indicated by these figures, has been generally recognized as regards wholesale trade. But the idea is often expressed that in retail trade almost all transactions are settled in ready money. This notion, however, is far from being exact. Dr. Kinley has made a careful investigation of this subject with the coöperation of the Comptroller of the Currency. He arrives at the conclusion that less than one-half of all retail transactions are settled by money payments.<sup>4</sup> This indicates that the increase in the need of money, commonly thought to follow an increase in population, is not nearly so great as is usually supposed.

The data will be completed by giving the statistics for the increase of monetary means of exchange. From Miss Hardy's

<sup>1</sup> See table, p. 156, JOURNAL OF POLITICAL ECONOMY for March 1895.

<sup>2</sup> These five were in New York, Boston, Philadelphia, Baltimore and Cleveland.—See LALOR'S *Cyclopædia of Political Science, Political Economy and United States History*, article "Clearing Houses."

<sup>3</sup> *Statistical Abstract* (1894), p. 50.

<sup>4</sup> JOURNAL OF POLITICAL ECONOMY, March 1895.

table<sup>1</sup> it appears that the volume of the currency was almost three and one-half times as great in 1891 as in 1860.

Summing up the evidence which has been presented, it seems (1) that the total increase in the amount of goods to be exchanged varies, so far as estimated, from about twofold in agriculture to a little less than fivefold in manufactures; (2) that the ratio of increase in the volume of transactions was less than this because the average number of times that the same goods changed hands in passing from producer to consumer decreased, owing to alterations in business methods; (3) that of the means for accomplishing this growing money work, the use of credit instruments, as indicated in bank deposits, increased over eleven times for the country as a whole; while (4) the amount of money in use increased three and one-half times.

By a different combination, these data may be made to yield a more definite result. President Walker, it will be recalled, holds that the demand for money is the total amount of exchanges to be performed, minus the portion performed by the use of credit instruments, or by barter.<sup>2</sup> The increased money work in the United States may be roughly measured by taking the increase of transactions as fivefold—which is certainly an exaggerated estimate. Then if there were 100 units of money work to be performed in 1860, there were 500 units in 1891. At the former date the money circulation of the country formed 63 per cent. of the total media of exchange; that is, of the bank-deposit currency plus the money. At the latter date it formed 33 per cent. Then in 1860 the work performed by money was 63 per cent. of 100 units, or 63 units. In 1891 it was 33 per cent. of 500 units, or 165 units. This is an increase of not quite two and two-third times in the work done by money. But meanwhile the amount of the circulating medium had increased nearly three and one-half times.<sup>3</sup>

<sup>1</sup> JOURNAL OF POLITICAL ECONOMY, March 1895, p. 156.

<sup>2</sup> *Political Economy*, p. 133.

<sup>3</sup> As this calculation is of considerable importance to the argument, it will not be amiss to explain particularly the data on which it rests. First as to the bank currency. The *Annual Report of the Secretary of the Treasury* for 1860 (p. 448) gives the deposits

The course of prices in the United States, then, presents a case which cannot be explained by the quantity theory. Prices fell while the supply of money was increasing. The defense offered that the demand rose more rapidly than the supply seems to be founded on a mistaken generalization made without reference to the facts. Thus the results of the inductive study confirm the conclusions arrived at by the theoretical examination. Studied from either point of view, the theory seems to be defective.

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in the banks of the United States in that year as \$253,802,129. The *Report of the Comptroller of the Currency* for 1892 (Vol. I. p. 85) gives the "individual deposits" (not including savings deposits) of "all state banks, loan and trust companies, savings and private banks, 1891-2," as \$1,198,825,545. The *Statistical Abstract* for 1894 (p. 43) gives the "net deposits" of the national banks in the United States, September 25, 1891, as \$1,758.6 millions. For the amount of the currency, the estimates in the *Annual Report of the Secretary of the Treasury* for 1893 (Table II. p. cviii) are followed. These give the volume of the currency as \$435,407,252 in 1860, and \$1,497,440,707 in 1891. Combining these data we find that the bank currency, plus the money in circulation, was \$689.2 millions in 1860, of which money composed \$435.4 millions or 63 per cent., and \$4,454.8 millions in 1891, when the money was \$1,497.4 millions, or 33 per cent.

As to the amount of transactions, the estimate of the increase at fivefold seems very large. It will be recollected that the statistics presented above indicate that agricultural production and importation have not increased nearly in this proportion, while even manufactures fell short of it. Besides this, no account is taken of the tendency to a decrease in the volume of transactions, arising from the changes in business methods, which have lessened the average number of times goods are exchanged in passing from producer to consumer. When it is added to this, that all credit media of exchange, (such as clearing house operations, book accounts, etc.), except bank deposits, are excluded entirely,—that is, that all transactions, except those performed by the use of deposit currency, are assumed to be performed by the use of money—the above calculation seems conservative enough.